

General

Title

Hip osteoarthritis: hip replacement mortality rate.

Source(s)

AHRQ quality indicators. Guide to inpatient quality indicators: quality of care in hospitals - volume, mortality, and utilization [version 3.1]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2007 Mar 12. 91 p.

AHRQ quality indicators. Inpatient quality indicators: technical specifications [version 4.2]. IQI #14 hip replacement mortality rate. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2010 Sep. 2 p.

Measure Domain

Primary Measure Domain

Outcome

The validity of measures depends on how they are built. By examining the key building blocks of a measure, you can assess its validity for your purpose. For more information, visit the [Measure Validity](#) page.

Secondary Measure Domain

Does not apply to this measure

Brief Abstract

Description

This measure is used to assess the number of deaths per 100 patients with discharge procedure code of partial or full hip replacement.

Because hip replacement is an elective procedure, some selection of patient population may create bias. Risk adjustment for clinical factors, or at a minimum 3M™ All-Patient Refined Diagnosis-Related Groups (APR-DRGs), is recommended because of the confounding bias for hip replacement. In addition, little evidence exists supporting the construct validity of this indicator.

Rationale

About 30% of personal health care expenditures in the United States go towards hospital care, and the rate of growth in spending for hospital services has only recently leveled out after several years of increases following a half a decade of declining growth. Simultaneously, concerns about the quality of health care services have reached a crescendo with the Institute of Medicine's series of reports describing the problem of medical errors and the need for a complete restructuring of the health care system to improve the quality of care. Policymakers, employers, and consumers have made the quality of care in U.S. hospitals a top priority and have voiced the need to assess, monitor, track, and improve the quality of inpatient care.

Total hip arthroplasty (without hip fracture) is an elective procedure performed to improve function and relieve pain among patients with chronic osteoarthritis, rheumatoid arthritis, or other degenerative processes involving the hip joint. Better processes of care may reduce mortality for hip replacement, which represents better quality care.

Note:

The following caveats were identified from the literature review for the "Hip Replacement Mortality Rate" indicator:

Selection bias^a: This results when a substantial percentage of care for a condition is provided in the outpatient setting, so the subset of inpatient cases may be unrepresentative. Examination of outpatient care or emergency care data may help to reduce this in these cases.

Confounding bias^a: Patient characteristics may substantially affect the performance of the indicator; risk adjustment is recommended.

Unclear construct^a: There is uncertainty or poor correlation with widely accepted process measures.

Refer to the original measure documentation for further details.

a - The concern is theoretical or suggested, but no specific evidence was found in the literature.

Primary Clinical Component

Hip osteoarthrosis; hip replacement; mortality

Denominator Description

All discharges, age 18 years and older, with a partial or full hip replacement code of procedure field. Include only discharges with uncomplicated cases: diagnosis codes for osteoarthrosis of hip in any diagnosis field.

Exclude cases:

With any diagnosis of hip fracture

Missing discharge disposition, gender, age, quarter, year, or principal diagnosis

Transferring to another short-term hospital

Major Diagnostic Category (MDC) 14 (pregnancy, childbirth, and puerperium)

Note: Refer to the Technical Specifications document for specific International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) codes.

Numerator Description

Number of deaths among cases meeting the inclusion and exclusion rules for the denominator

Evidence Supporting the Measure

Evidence Supporting the Criterion of Quality

One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal

Evidence Supporting Need for the Measure

Need for the Measure

Variation in quality for the performance measured

Evidence Supporting Need for the Measure

AHRQ quality indicators. Guide to inpatient quality indicators: quality of care in hospitals - volume, mortality, and utilization [version 3.1]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2007 Mar 12. 91 p.

State of Use of the Measure

State of Use

Current routine use

Current Use

External oversight/State government program

Internal quality improvement

Quality of care research

Application of Measure in its Current Use

Care Setting

Hospitals

Professionals Responsible for Health Care

Physicians

Lowest Level of Health Care Delivery Addressed

Single Health Care Delivery Organizations

Target Population Age

Age greater than or equal to 18 years

Target Population Gender

Either male or female

Stratification by Vulnerable Populations

Unspecified

Characteristics of the Primary Clinical Component

Incidence/Prevalence

Primary total hip arthroplasty is one of the most frequent types of major orthopedic surgery; about 160,000 were performed in the United States in 1998.

Evidence for Incidence/Prevalence

Popovic JR, Kozak LJ. National hospital discharge survey: annual summary, 1998. Vital Health Stat 13. 2000 Sep;(148):1-194. [PubMed](#)

Association with Vulnerable Populations

Elderly patients are at a significant risk of post-operative complications such as pneumonia, osteomyelitis, myocardial ischemia, and deep vein thrombosis. If not recognized and effectively treated, complications may lead to life-threatening problems.

Evidence for Association with Vulnerable Populations

AHRQ quality indicators. Guide to inpatient quality indicators: quality of care in hospitals - volume, mortality, and utilization [version 3.1]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2007 Mar 12. 91 p.

Burden of Illness

Unspecified

Utilization

Unspecified

Costs

Unspecified

Institute of Medicine (IOM) Healthcare Quality Report Categories

IOM Care Need

Getting Better

IOM Domain

Effectiveness

Data Collection for the Measure

Case Finding

Users of care only

Description of Case Finding

Discharges, age 18 years and older, with osteoarthritis of hip who had a partial or full hip replacement (see the "Denominator Inclusions/Exclusions" field)

Denominator Sampling Frame

Patients associated with provider

Denominator Inclusions/Exclusions

Inclusions

All discharges, age 18 years and older, with a partial or full hip replacement code of procedure field. Include only discharges with uncomplicated cases: diagnosis codes for osteoarthritis of hip in any diagnosis field.

Exclusions

Exclude cases:

- With any diagnosis of hip fracture
- Missing discharge disposition, gender, age, quarter, year, or principal diagnosis
- Transferring to another short-term hospital
- Major Diagnostic Category (MDC) 14 (pregnancy, childbirth, and puerperium)

Note: Refer to the Technical Specifications document for specific International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) codes.

Relationship of Denominator to Numerator

All cases in the denominator are equally eligible to appear in the numerator

Denominator (Index) Event

Clinical Condition

Institutionalization

Therapeutic Intervention

Denominator Time Window

Time window brackets index event

Numerator Inclusions/Exclusions

Inclusions

Number of deaths among cases meeting the inclusion and exclusion rules for the denominator

Exclusions

Unspecified

Measure Results Under Control of Health Care Professionals, Organizations and/or Policymakers

The measure results are somewhat or substantially under the control of the health care professionals, organizations and/or policymakers to whom the measure applies.

Numerator Time Window

Institutionalization

Data Source

Administrative data

Level of Determination of Quality

Not Individual Case

Outcome Type

Clinical Outcome

Pre-existing Instrument Used

Unspecified

Computation of the Measure

Scoring

Rate

Interpretation of Score

Better quality is associated with a lower score

Allowance for Patient Factors

Analysis by subgroup (stratification on patient factors, geographic factors, etc.)

Case-mix adjustment

Risk adjustment method widely or commercially available

Description of Allowance for Patient Factors

Observed (raw) rates may be stratified by hospitals, age groups, race/ethnicity categories, sex, and payer categories.

Risk adjustment of the data is recommended using, at minimum, age, sex, and 3M™ All-Patient Refined Diagnosis-Related Groups (APR-DRGs)*.

Application of multivariate signal extraction (MSX) to smooth risk adjusted rates is also recommended.

*Note: Information on the 3M™ APR-DRG system is available at

http://solutions.3m.com/wps/portal/3M/en_US/3M_Health_Information_Systems/HIS/Products/APRDRG_Software/ .

Standard of Comparison

External comparison at a point in time

External comparison of time trends

Internal time comparison

Evaluation of Measure Properties

Extent of Measure Testing

Each potential quality indicator was evaluated against the following six criteria, which were considered essential for determining the reliability and validity of a quality indicator: face validity, precision, minimum bias, construct validity, fosters real quality improvement, and application. The project team searched Medline for articles relating to each of these six areas of evaluation. Additionally, extensive empirical testing of all potential indicators was conducted using the 1995-97 Healthcare Cost and Utilization Project (HCUP) State Inpatient Databases (SID) and Nationwide Inpatient Sample (NIS) to determine precision, bias, and construct validity. Table 2 in the original measure documentation summarizes the results of the literature review and empirical evaluations on the Inpatient Quality Indicators. Refer to the original measure documentation for details.

Evidence for Reliability/Validity Testing

AHRQ quality indicators. Guide to inpatient quality indicators: quality of care in hospitals - volume, mortality, and utilization [version 3.1]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2007 Mar 12. 91 p.

Identifying Information

Original Title

IQI #14 hip replacement mortality rate.

Measure Collection Name

Agency for Healthcare Research and Quality (AHRQ) Quality Indicators

Measure Set Name

Inpatient Quality Indicators

Submitter

Agency for Healthcare Research and Quality - Federal Government Agency [U.S.]

Developer

Agency for Healthcare Research and Quality - Federal Government Agency [U.S.]

Funding Source(s)

Agency for Healthcare Research and Quality (AHRQ)

Composition of the Group that Developed the Measure

The Agency for Healthcare Research and Quality (AHRQ) Quality Indicators are in the public domain and the specifications come from multiple sources, including the published and unpublished literature, users, researchers, and other organizations. AHRQ as an agency is responsible for the content of the indicators.

Financial Disclosures/Other Potential Conflicts of Interest

None

Adaptation

Hip replacement was included in the original Healthcare Cost and Utilization Project Quality Indicators (HCUP QIs).

Parent Measure

In-hospital mortality following common elective procedures (Agency for Healthcare Research and Quality)

Release Date

2002 Jun

Revision Date

2010 Sep

Measure Status

This is the current release of the measure.

This measure updates previous versions:

AHRQ quality indicators. Guide to inpatient quality indicators: quality of care in hospitals -- volume, mortality, and utilization [version 3.0]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2006 Feb 20. 99 p.

AHRQ quality indicators. Inpatient quality indicators: technical specifications [version 4.1]. IQI #14 hip replacement mortality rate. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2009 Dec 1. 2 p.

Source(s)

AHRQ quality indicators. Guide to inpatient quality indicators: quality of care in hospitals - volume, mortality, and utilization [version 3.1]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2007 Mar 12. 91 p.

AHRQ quality indicators. Inpatient quality indicators: technical specifications [version 4.2]. IQI #14 hip replacement mortality rate. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2010 Sep. 2 p.

Measure Availability

The individual measure, "IQI #14 Hip Replacement Mortality Rate," is published in "AHRQ Quality Indicators. Guide to Inpatient Quality Indicators: Quality of Care in Hospitals -- Volume, Mortality, and Utilization" and "AHRQ Quality Indicators. Inpatient Quality Indicators: Technical Specifications." These documents are available in Portable Document Format (PDF) from the [Inpatient Quality Indicators Resources](#) page at the Agency for Healthcare Research and Quality (AHRQ) Quality Indicators Web site.

For more information, please contact the QI Support Team at support@qualityindicators.ahrq.gov.

Companion Documents

The following are available:

AHRQ quality indicators. Inpatient quality indicators: software documentation, SAS [version 4.2]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2010 Sep. 41 p. This document is available in Portable Document Format (PDF) from the [Agency for Healthcare Research and Quality \(AHRQ\) Quality Indicators Web site](#) .

AHRQ quality indicators. Software documentation: Windows [version 4.1a]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2010 Jul 2. 97 p. This document is available in PDF from the [AHRQ Quality Indicators Web site](#) .

AHRQ quality indicators. Inpatient quality indicators composite measure workgroup. Final report. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2008 Mar. various p. This document is available in PDF from the [AHRQ Quality Indicators Web site](#) .

UCSF-Stanford Evidence-based Practice Center. Davies GM, Geppert J, McClellan M, et al. Refinement

of the HCUP quality indicators. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2001 May. 24 p. (Technical review; no. 4). This document is available in PDF from the [AHRQ Quality Indicators Web site](#) .

AHRQ quality indicator. Comparative data for the IQI based on the 2008 Nationwide Inpatient Sample (NIS) [version 4.1b]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2010 Sep. 20 p. This document is available in PDF from the [AHRQ Quality Indicators Web site](#) .

AHRQ quality indicator. Risk adjustment coefficients for the IQI [version 4.2]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2010 Sep. 20 p. This document is available in PDF from the [AHRQ Quality Indicators Web site](#) .

AHRQ quality indicators. Composite measures user guide for the inpatient quality indicators (IQI) [version 4.2]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2010 Sep. 6 p. This document is available in PDF from the [AHRQ Quality Indicators Web site](#) .

HCUPnet: a tool for identifying, tracking, and analyzing national hospital statistics. [Web site]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); [accessed 2011 May 24]. HCUPnet is available from the [AHRQ Web site](#) . See the related [QualityTools](#) summary.

NQMC Status

This NQMC summary was completed by ECRI on December 4, 2002. The information was verified by the Agency for Healthcare Research and Quality on December 26, 2002. This NQMC summary was updated by ECRI on April 7, 2004, August 19, 2004, and March 4, 2005. The information was verified by the measure developer on April 22, 2005. This NQMC summary was updated by ECRI Institute on August 17, 2006, on May 29, 2007, on October 20, 2008 and again on August 27, 2010. This NQMC summary was reviewed and edited by ECRI on July 13, 2011.

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